

TABLE 1 TO SUBPART WWWW OF PART 63—EQUATIONS TO CALCULATE ORGANIC HAP EMISSIONS FACTORS FOR SPECIFIC OPEN MOLDING AND CENTRIFUGAL CASTING PROCESS STREAMS

Table 1 to Subpart WWWW of Part 63—Equations to Calculate Organic HAP Emissions Factors for Specific Open Molding and Centrifugal Casting Process Streams <sup>1</sup>		
As specified in §63.5810, use the equations in the following table to calculate organic HAP emissions factors for specific open molding and centrifugal casting process streams.		
If your operation type is a new or existing...	And you use...	With...
Use this organic HAP Emissions Factor (EF) Equation for materials with 33 percent or more organic HAP less than 33 percent organic HAP (19 percent organic HAP coat) 23% ... for nonatomized gel coat		
Use this organic HAP Emissions Factor (EF) Equation for materials with 33 percent or more organic HAP less than 33 percent organic HAP (19 percent organic HAP coat) 23% ... for nonatomized gel coat		
1. open molding operation	a. manual resin application	i. nonvapor-suppressed resin EF = $0.126 \times \% \text{HAP} \times 2000$ EF = $((0.286 \times \% \text{HAP}) - 0.0529) \times 2000$
		ii. vapor-suppressed resin EF = $0.126 \times \% \text{HAP} \times 2000 \times (1 - (0.5 \times \text{VSE factor}))$ EF = $((0.286 \times \% \text{HAP}) - 0.0529) \times (1 - (0.5 \times \text{VSE factor})) \times 2000$
		iii. vacuum bagging/closed-mold curing with roll-out EF = $0.126 \times \% \text{HAP} \times 2000 \times 0.8$ EF = $((0.286 \times \% \text{HAP}) - 0.0529) \times 2000 \times 0.8$
		iv. vacuum bagging/closed-mold curing without roll-out EF = $0.126 \times \% \text{HAP} \times 2000 \times 0.5$ EF = $((0.286 \times \% \text{HAP}) - 0.0529) \times 2000 \times 0.5$
b. atomized mechanical resin application	i. nonvapor-suppressed resin	EF = $0.169 \times \% \text{HAP} \times 2000$ EF = $((0.714 \times \% \text{HAP}) - 0.18) \times 2000$
	ii. vapor-suppressed resin	EF = $0.169 \times \% \text{HAP} \times 2000 \times (1 - (0.45 \times \text{VSE factor}))$ EF = $((0.714 \times \% \text{HAP}) - 0.18) \times (1 - (0.45 \times \text{VSE factor})) \times 2000$
	iii. vacuum bagging/closed-mold curing with roll-out	EF = $0.169 \times \% \text{HAP} \times 2000 \times 0.85$ EF = $((0.714 \times \% \text{HAP}) - 0.18) \times 2000 \times 0.85$
	iv. vacuum bagging/closed-mold curing without roll-out	EF = $0.169 \times \% \text{HAP} \times 2000 \times 0.55$ EF = $((0.714 \times \% \text{HAP}) - 0.18) \times 2000 \times 0.55$
c. nonatomized mechanical resin application	i. nonvapor-suppressed resin	EF = $0.107 \times \% \text{HAP} \times 2000$ EF = $((0.157 \times \% \text{HAP}) - 0.0165) \times 2000$
	ii. vapor-suppressed resin	EF = $0.107 \times \% \text{HAP} \times 2000 \times (1 - (0.45 \times \text{VSE factor}))$ EF = $((0.157 \times \% \text{HAP}) - 0.0165) \times (1 - (0.45 \times \text{VSE factor})) \times 2000$
	iii. closed-mold curing with roll-out	EF = $0.107 \times \% \text{HAP} \times 2000 \times 0.85$ EF = $((0.157 \times \% \text{HAP}) - 0.0165) \times 2000 \times 0.85$
	iv. vacuum bagging/closed-mold curing without roll-out	EF = $0.107 \times \% \text{HAP} \times 2000 \times 0.55$ EF = $((0.157 \times \% \text{HAP}) - 0.0165) \times 2000 \times 0.55$
d. atomized mechanical resin application with robotic or augmented spray control	nonvapor-suppressed resin	EF = $0.169 \times \% \text{HAP} \times 2000 \times 0.77$ EF = $0.77 \times ((0.714 \times \% \text{HAP}) - 0.18) \times 2000$
	i. nonvapor-suppressed resin	EF = $0.184 \times \% \text{HAP} \times 2000$ EF = $((0.2746 \times \% \text{HAP}) - 0.0298) \times 2000$
	ii. vapor-suppressed resin	EF = $0.12 \times \% \text{HAP} \times 2000$ EF = $((0.2746 \times \% \text{HAP}) - 0.0298) \times 2000 \times 0.85$
	f. atomized spray gel coat application	EF = $0.445 \times \% \text{HAP} \times 2000$ EF = $((1.03646 \times \% \text{HAP}) - 0.195) \times 2000$
e. filament application <sup>6</sup>		

2. centrifugal casting operations <sup>7</sup>	g. nonatomized spray gel coat application	nonvapor-suppressed gel coat	EF = 0.185 x \$HAP x 2000	EF = ((0.4506 x \$HAP) - 0.0505) x 2000
	h. atomized spray gel coat application using robotic or automated spray	nonvapor-suppressed gel coat	EF = 0.445 x \$HAP x 2000 x 0.73	EF = ((1.03646 x \$HAP) - 0.195) x 2000 x 0.73
	a. heated air blown through molds	nonvapor-suppressed resin	EF = 0.558 x (\$HAP) x 2000	EF = 0.558 x (\$HAP) x 2000
	b. vented molds, but air vented through the molds is not heated	nonvapor-suppressed resin	EF = 0.026 x (\$HAP) x 2000	EF = 0.026 x (\$HAP) x 2000

## Footnotes to Table 1

<sup>1</sup> The equations in this table are intended for use in calculating emission factors to demonstrate compliance with the emission limits in subpart WWWW. These equations may not be the most appropriate method to calculate emission estimates for other purposes. However, this does not preclude a facility from using the equations in this table to calculate emission factors for purposes other than rule compliance if these equations are the most accurate available.

<sup>2</sup> To obtain the organic HAP emissions factor value for an operation with an add-on control device multiply the EF above by the add-on control factor calculated using Equation 1 of §63.5810. The organic HAP emissions factors have units of lbs of organic HAP per ton of resin or gel coat applied.

<sup>3</sup> Percent HAP means total weight percent of organic HAP (styrene, methyl methacrylate, and any other organic HAP) in the resin or gel coat prior to the addition of fillers, catalyst, and promoters. Input the percent HAP as a decimal, i.e., 33 percent HAP should be input as 0.33, not 33.

<sup>4</sup> The VSE factor means the percent reduction in organic HAP emissions expressed as a decimal measured by the VSE test method of appendix A to this subpart.

<sup>5</sup> This equation is based on a organic HAP emissions factor equation developed for mechanical atomized controlled spray. It may only be used for automated or robotic spray systems with atomized spray. All spray operations using hand held spray guns must use the appropriate mechanical atomized or mechanical nonatomized organic HAP emissions factor equation. Automated or robotic spray systems using nonatomized spray should use the appropriate nonatomized mechanical resin application equation.

<sup>6</sup> Applies only to filament application using an open resin bath. If resin is applied manually or with a spray gun, use the appropriate manual or mechanical application organic HAP emissions factor equation.

<sup>7</sup> These equations are for centrifugal casting operations where the mold is vented during spinning. Centrifugal casting operations where the mold is completely sealed after resin injection are considered to be closed molding operations.

<sup>8</sup> If a centrifugal casting operation uses mechanical or manual resin application techniques to apply resin to an open centrifugal casting mold, use the appropriate open molding equation with covered cure and no rollout to determine an emission factor for operations prior to the closing of the centrifugal casting mold. If the closed centrifugal casting mold is vented during spinning, use the appropriate centrifugal casting equation to calculate an emission factor for the portion of the process where spinning and cure occur. If a centrifugal casting operation uses mechanical or manual resin application techniques to apply resin to an open centrifugal casting mold, and the mold is then closed and is not vented, treat the entire operation as open molding with covered cure and no rollout to determine emission factors.